

11. The method of claim 5, wherein the conductor is a copper wiring.

REMARKS

Applicant thanks the Examiner for acknowledging receipt of Applicant's foreign Priority Documents under 35 U.S.C. §119. Applicant respectfully requests reconsideration of the rejection of claim 6 under 35 U.S.C. §112, first paragraph. In that regard, the Examiner has asserted that claim 6 contains subject matter which is not adequately described in the Specification in order to enable a person skilled in the art to make and use the claimed invention without undue experimentation. The Examiner notes that claim 6 is directed to a method of forming a cobalt silicide layer by exposing the cobalt including layer (CoWP) in a system containing silane gas. The Specification discloses at page 8, lines 7-19 that the substrate is introduced into a chemical vapor deposition system and the base substrate is heated to a predetermined temperature in order to form the cobalt silicide.

The Examiner has asserted that this is inadequate in order to enable one skilled in the art to form the cobalt silicide layer. The Examiner has asserted that temperature and even ramp conditions are critical for the process and will define the phase of the silicide nucleated and that a great deal of experimentation would be required.

In response to this rejection, Applicant submits that there is more than adequate description in the Specification regarding the claimed invention. More specifically, Applicant notes that the art is well aware of techniques for growing cobalt silicide films through chemical vapor deposition and the like. More specifically, see, for example, United States Patent No. 4,814,294 which describes examples of such methods. This technology is more than ten years old and well-known to a person having ordinary skill in the art. Accordingly, Applicant need not disclose these well-known techniques for accomplishing the formation of the claimed cobalt silicide structure. Applicant's invention is not merely the

formation of the cobalt silicide structure but the application of this well-known structure in a new and unique manner. See also United States Patent No. 6,346,477 which recognizes this fact as well. Accordingly, in light of the foregoing, Applicant requests that the Examiner withdraw this rejection.

Applicant respectfully requests reconsideration of the prior art rejections set forth by the Examiner under 35 U.S.C. §§102 and 103. Applicant respectfully submits that the prior art references of record, whether considered alone, or in combination, fail to either teach or suggest Applicant's presently claimed invention.

Applicant's claimed invention is directed to new and improved conductive structures for semiconductor devices wherein a cobalt containing layer is formed over a conductor and a further cladding layer for protecting the cobalt containing layer is provided. Applicant submits that the references cited by the Examiner provide no teaching or suggestion whatsoever regarding this advance in the art. Accordingly, the claims should all be allowed.

More specifically, the Examiner has based the rejection upon the *Lopatin* reference, United States Patent No. 6,259,160 in conjunction with several additional references. By the Examiner's own assessment, the *Lopatin* reference merely teaches the formation of a copper conductor with a CoWP layer formed over the copper conductor as an oxidation resistant layer. The Examiner specifically recognized that the *Lopatin* reference does not disclose or suggest the formation of the cobalt silicide layer on the surface of the CoWP layer.

In order to overcome this recognized deficiency, the Examiner relies upon *Matsushita* reference and/or the *Shacham-Diamond* reference. In that regard, Applicant notes that neither one of the cited supplemental references upon which the Examiner relies in rejecting the claims provides the requisite teaching or suggestion to invalidate the claimed invention. More specifically, Applicant notes the *Matsushita* reference is merely directed to the formation of cobalt silicide for use in forming electrodes and interconnects of

semiconductor devices. In *Matsushita* the cobalt silicide is the conductor itself and not the claimed cladding layer for protecting a cobalt including layer. Fundamentally this reference merely teaches the formation of interconnection lines formed from cobalt silicides.

In order to provide the appropriate support for a prior art rejection under 35 U.S.C. §103, there must be some teaching or suggestion in the art in order to make the combination which results in Applicant's claimed invention. Here there would be no such motivation for the person skilled in the art to combine the cited references in order to result in the claimed invention. This is due to the fact that each prior art reference technique describes the independent formation of a conductor or interconnect member and not the formation of a cladding layer as claimed. The same deficiency is found in the *Shacham-Diamond* reference in that it similarly fails to teach or suggest the formation of the claimed cladding layer.

The person of ordinary skill in the art would not have been motivated to combine the cited references because each reference independently describes the formation of a conductor and there would be no motivation to combine two distinct ways to form a single conductive member.

Accordingly, because the Examiner has failed to demonstrate the appropriate basis for rejecting the claims, Applicant respectfully submits that the rejections should be withdrawn and all claims should now be allowed.

Respectfully submitted,

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